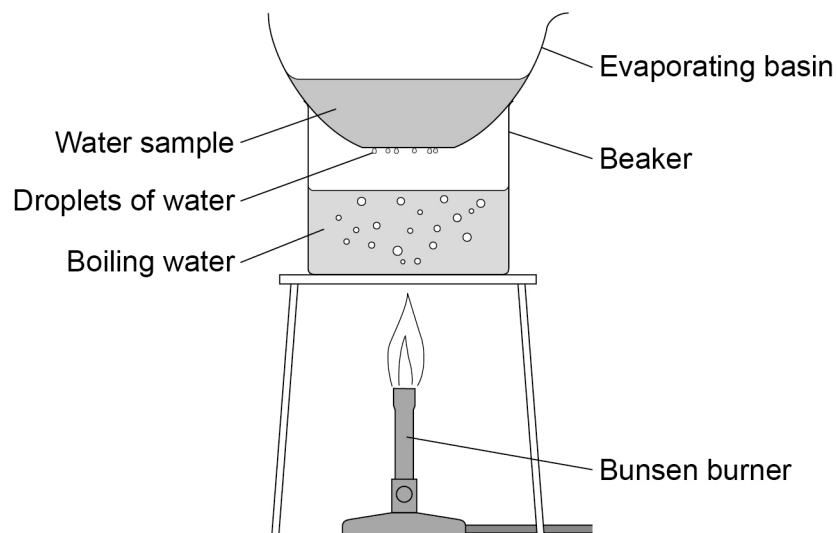


0 4

A student investigated the mass of dissolved solids in four water samples **A**, **B**, **C** and **D**.

Figure 4 shows the apparatus used.

Figure 4



This is the method used.

1. Record the mass of a dry evaporating basin.
2. Pour 25 cm³ of water sample **A** into the evaporating basin.
3. Place the evaporating basin on the beaker for 10 minutes.
4. Record the mass of the evaporating basin and contents.
5. Repeat steps 1 to 4 with water sample **A** three more times.
6. Repeat steps 1 to 5 with water samples **B**, **C** and **D**.



0 4 . 1 What type of variable is the mass of dissolved solids?

[1 mark]

Tick (✓) **one** box.

Categoric

Control

Dependent

Independent

0 4 . 2 The method produced an error in the mass recorded in step 4.

Suggest what caused the error.

How could the error be avoided?

[2 marks]

Error _____

Avoided by _____

Question 4 continues on the next page

Turn over ►



Another student carried out the investigation correctly.

Table 1 shows the results.

Table 1

Water sample	Mass of dissolved solids in g				
	Test 1	Test 2	Test 3	Test 4	Mean
A	0.22	0.23	0.20	X	0.21
B	0.03	0.08	0.02	0.03	0.04
C	0.45	0.60	0.49	0.58	0.53
D	0.80	0.91	0.79	0.86	0.84

0 4 . 3 Calculate value **X** in **Table 1**.

[2 marks]

X = _____ g

0 4 . 4 Which water sample has the greatest range of masses of dissolved solids?

Give the reason for your answer.

[2 marks]

Water sample _____

Reason _____



0	4	.	5
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Water companies measure the volume of water used by households in cubic metres (m^3).

25 cm^3 of a different water sample contained 0.016 g of dissolved solids.

Calculate the mass of dissolved solid in 1 m^3 of this water sample.

$1 \text{ m}^3 = 1000 \text{ dm}^3$

Give your answer in standard form.

[4 marks]

Mass (in standard form) = _____ g

11

Turn over for the next question

Turn over ►



Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.1	dependent		1	AO1 5.10.1.2
04.2	not all water had been removed from the sample heat to constant mass alternative approach: mass included (droplets of) water on the bottom of the evaporating basin (1) dry the bottom of the evaporating basin (1)	allow description of process allow bottom of evaporating basin was wet ignore spillages ignore weighing errors allow wipe off droplets	1 1	AO3 5.10.1.2
04.3	$\frac{0.22 + 0.23 + 0.20 + X}{4} = 0.21$ (X =) 0.19 (g)		1 1	AO2 5.10.1.2
04.4	C biggest difference between the maximum and minimum values	allow ecf from question 04.3 allow calculated range if all ranges are shown A 0.04; B 0.06; C 0.15 and D 0.12	1 1	AO2 5.10.1.2

04.5	(conversion m ³ to cm ³) 1 m ³ = 1 x 10 ⁶ cm ³		1	AO2 5.3.2.5 5.10.1.2
	(mass =) $1 \times 10^6 \times \frac{0.016}{25}$	allow correct use of an incorrect / no conversion value	1	
	= 640 (g)		1	
	= 6.4 x 10 ² (g)	allow a correctly calculated answer in standard form from an incorrect calculation of mass	1	

Total			11
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